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(54) **Remote management system for automatic dispensers and equipment for actuating the said system.**

(57) The present invention relates to a remote management system for automatic dispensers of physical and virtual products, of the type provided with a display to show the available products, a push-button panel to request the products, a device to receive payment, and a printer to print payment receipts, characterised in that each local dispenser is designed to communicate with a centralised server associated with management software with encrypted messages over a non-dedicated data-network.

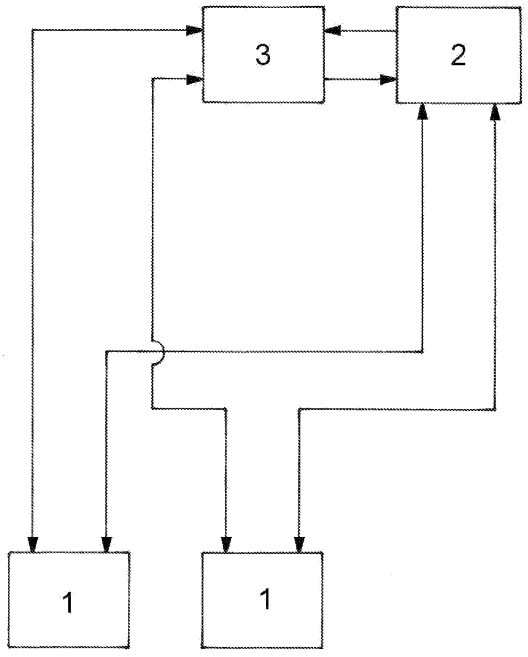

FIG. 1

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Description

[0001] The present patent application for industrial invention relates to a remote management system for automatic dispensers of virtual and physical products, and to the equipment for actuating the said system.

[0002] As it is known, automatic dispensers are largely used to dispense "physical" (such as soft drinks, cigarettes, tickets, etc.) and "virtual" products (such as plane or train tickets, telephone recharge, etc.).

[0003] It must be noted, however, that the operation and management modes of the current dispensers have shown significant inconveniences.

[0004] The main limit of the dispensers used to distribute physical products consists in the impossibility to provide remote control and management.

[0005] Because of the lack of remote control, the said dispensers require the surveillance of operators to check possible anomalies on site and refill the products when they are finished.

[0006] On the contrary, remote connection is sometimes provided in current dispensers of virtual products; this is done to exchange information and allow the control station to immediately verify the operation conditions of the dispensers connected to it and the dispensers to receive information for the distribution of the requested virtual product (such as, for example, verification of the identification code to recharge telephones) from the control station.

[0007] The critical aspect of such a technology consists in the fact that the connection between the remote central unit and the local dispensers is provided over a public data network (ADSL, ISDN, etc.), that is to say over a dedicated line.

[0008] Such a solution is impaired by at least two types of inconveniences: firstly, it conditions the location of the local dispensers, which cannot be located in areas that are not covered by the data network signal.

[0009] Secondly, - probably being the most severe limitation - the connection to a similar dedicated data network requires an input (such as, for example, an IP static or dynamic address) that is configured as an access port subjected to possible intrusions by individuals with the intention to interfere with the data exchange between the remote central unit and the local dispensers.

[0010] Moreover, the activation of a system that works over similar dedicated networks has a high cost, which can be borne only by companies with significant economic means.

[0011] A careful evaluation of the state of the art has led to design the operative logic of the invention and develop the equipment for its practical implementation.

[0012] In particular, the new operative logic, which is advantageously applied in local dispensers of both virtual and physical products, provides for the connection between the units over a direct "reserved" connection - no longer over a public data network - obtained by means of a non-dedicated network in which the interaction between the units is provided by text messages (SMS).

[0013] In addition to increase the system versatility, this connection logic guarantees a higher privacy level (meaning the capability to resist intrusion attempts) than the one provided by dedicated public networks.

[0014] The practical actuation of this interaction logic between different operative units is entrusted to an equipment that includes one or more local dispensers, a centralised remote server associated with management software, which are enabled by means of suitable modems used to transmit and receive encrypted information (such as in the case of a GPRS modem used to send and receive text messages).

[0015] The management software associated with the centralised server that supervises the operation of the entire system communicates over the server with the local dispensers to supply sales data, send advertising messages to potential customers and perform diagnostic and update functions.

[0016] More precisely, each local dispenser, which is traditionally equipped with a push-button panel to order the products and traditional payment systems, is equipped with a monitor that displays information on the available products and advertising messages.

[0017] The connection between the local dispenser and the management software allows verifying and updating the conditions of the local dispenser in real time by means of the remote server.

[0018] The management software is, for instance, designed to eliminate from the display of each local dispenser the products that are not available for sale, and integrate the information shown on the display of the local dispenser with the new products that are added to the range of available products or with information and/or advertising messages.

[0019] Of course, before displaying the products as available in the local dispenser, the new products must be "loaded" by the software also in the centralised server.

[0020] Based on the information supplied by the monitor of the local dispenser, the customer can use the push-button panel to purchase the desired product and pay the relevant price (in cash, with credit cards or ATM cards).

[0021] According to the request of each customer, the software of the local dispenser sends a text message to the centralised management software, which in turns sends a reply with a text message with encrypted code with univocal key (in such a way that a different encryption is used for each transaction) that requests the information that is necessary to enable the purchase of the product required by the customer, such as, for instance: a PIN code to enable telephone recharge, a recharge for an international telephone card, a PIN code to charge a pay-TV Smart-card, a PIN code to download logos and ring-tones for mobile telephones, cinema tickets, etc.

[0022] Moreover, a single transaction allows inserting multiple virtual products managed directly by the software of each local dispenser, preventing external access,

since the only possibility to access the local software is entrusted to the centralised management software.

[0023] The software of the local dispenser is able to decrypt the information received by the centralised management software, distribute the product and print the payment receipt.

[0024] Finally, it must be noted that according to the system of the invention the centralised software is provided for each local dispenser associated with it with a specific memory that is updated in real time on the actual availability of products in the local dispenser caused by sales operations.

[0025] The memory is automatically updated when the management software associated with the centralised server enables each single sales operation in the relevant local dispenser.

[0026] For clarity purposes, the description continues with an example of the operation mode of the system of the invention, which is intended for purposes of illustration only and not in a limiting sense.

[0027] Reference is made to the enclosed drawing, in which figure 1 is a block diagram of the units included in the actuation of the system of the invention.

[0028] In fig. 1 the local dispenser is indicated with numeral (1), the centralised server with numeral (2) and the management software with numeral (3).

[0029] In particular, the operation of the system is illustrated with reference to a situation in which the telephone recharges distributed by the local dispenser (1) are sold out.

[0030] In such a case, the local dispenser (1) with the sold-out product sends a text message to the management software (3) to activate the connection with the centralised server (2); the server (2) - which has been previously informed by the local dispenser (1) with a text message - will inform the management software (3) of the unavailability of telephone recharges.

[0031] Based on this information, the management software (3) provides the centralised server (2) with a certain quantity of telephone recharges and simultaneously sends a text message to the local dispenser (1), in order to enable the centralised server (2) to receive information on the actual telephone recharges available for sale.

[0032] This operative logic guarantees that the data base of the local dispenser (1) on the available telephone recharge (after multiple sales operations) corresponds to the data base of the centralised server (2); this means that the centralised server (2) is updated in real time on the sale of the telephone recharges of each local dispenser (1) and on the available quantity.

[0033] In such a case, reference is made to the different operative modes of the management system when each local dispenser (1) is used to distribute virtual products with standard value that can be directly refilled by the centralised server (2) (such as, for instance, telephone recharge), compared to the case in which the local dispenser (1) is used to distribute physical products with variable value to supply a service provided by an external company (such as, for instance, train tickets).

[0034] With reference to the first case, telephone recharges are usually sold with standardised values (25, 50, 75, 100 Euros).

[0035] In this case, the centralised server (2), which is suitably loaded with a certain quantity of standardised values, ensures the supply and enables the sale in the local dispenser (1) connected to it.

[0036] With reference to the second case (such as, for instance, train tickets), the fact that each ticket has a variable price does not allow the centralised server (2) to store and distribute tickets with predefined value to the different local dispensers (1).

[0037] Therefore, in case of a request for physical products at a local dispenser (1), the management software (3) connects the dispenser (1), by means of the centralised server (2), with the body that supplies the services associated with the aforementioned physical products.

Claims

1. Remote management system for automatic dispensers of physical and virtual products, of the type provided with a display to show the available products, a push-button panel to request the products, a device to receive payment, and a printer to print payment receipts, **characterised in that** each local dispenser (1) is designed to communicate with a centralised server (2) associated with management software (3) with encrypted messages over a non-dedicated data network.

2. System as claimed in claim 1, **characterised in that** the local dispenser (1) and the centralised server (2) are equipped with GPRS modem to manage and send encrypted messages as text messages (SMS).

3. System as claimed in the first or both claims, **characterised in that** the management software (3) is designed to refill each local dispenser (1) with the virtual products for sale and/or recharge the values to be associated with the physical products for sale by means of the centralised server (2).

4. System as claimed in one or more of the above claims, **characterised in that** the management software (3) is designed to receive the purchase requests from each local dispenser (1) for a physical or virtual product with standardised value loaded in the local dispenser (2) and enable the distribution of the correct quantities of the requested product by means of the centralised server (2).

5. System as claimed in one or more of claims 1 to 3, **characterised in that** the management software (3)

is designed to receive the purchase requests from each local dispenser (1) for a physical or virtual product with non-standardised value not loaded in the local dispenser (2) and enable the distribution of the correct quantities of the requested product, by means of the centralised server (2), after enabling an encrypted connection with the body that supplies the specific products and determines from time to time the price of the requested quantities.

6. System as claimed in one or more of the above claims, **characterised in that** the management software (3) is designed to verify and update in real time the conditions of each local dispenser (1) with reference to product refill, availability and non-availability, and update the memory dedicated to each specific local dispenser (1) in the centralised server (2).

7. System as claimed in one or more of the above claims, **characterised in that**, for each specific purchase request made by the customer, each local dispenser (1) is designed to send a text message (SMS) to the management software (3) associated with the centralised server (2), after which the management software (3) sends an encrypted reply by a text message with univocal key to enable the sale and request the information necessary to enable the purchase of the specific product requested by the customer.

8. Equipment for the actuation of a remote management system for automatic dispensers of physical and virtual products, of the type provided with a display to show the available products, a push-button panel to request the products, a device to receive payment, a printer to print payment receipts, **characterised in that** it comprises one or more local dispensers (1) designed to communicate with encrypted messages over non-dedicated data network, with a centralised server (2) associated with management software (3), according to the operative modes described in claims 2 to 7.

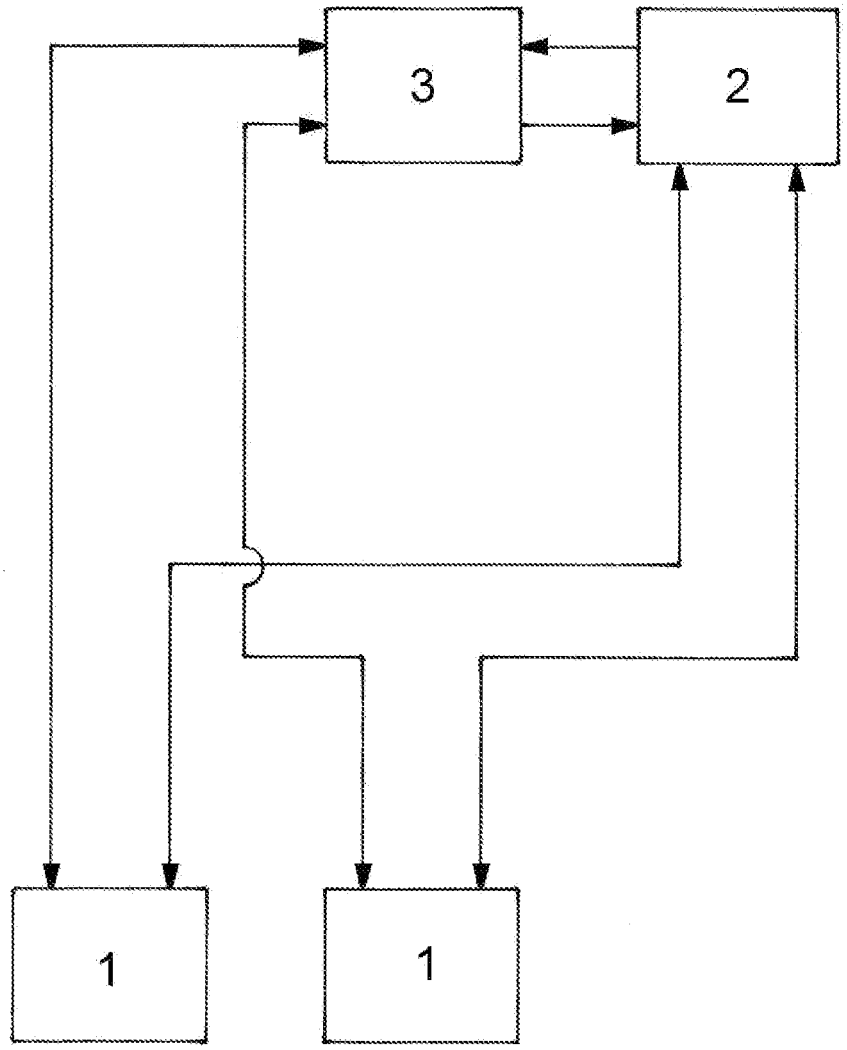

FIG. 1